Safety Interlock Switches
D4SL-N

SpeedSPEC
www.sti.com
D4SLN

Rev. 11.12b

World's Smallest Class 6-Contact Guard Lock Safety-Door Switch

Guard Lock Safety-door Switch D4SL-N
- Wiring time is reduced with two types of wiring methods capable of one-touch attachment and removal.
- A wide variety of built-in switches can be used for various devices.
  (4-, 5-, and 6-contact models are available)
- Key holding force of 1,300 N.
- It is possible to change the key insertion point without detaching the head.
- Drive solenoids directly from the Controller.

Slide Key D4SL-NSK10-LK□
- Lockout Key to prevent workers from becoming trapped inside the hazardous area.
- The vertical D4SL Guard Lock Safety-door Switch can be easily mounted on 40 x 40 mm aluminum frames.
- The plastic material makes the Slide Key suitable for lightweight doors.

NEW!

Slide Key

Terminal Block Type   Connector Type

G

Specifications

Standards and EC Directives

Conforms to the following EC Directives:
- Machinery Directive
- Low Voltage Directive
- EMC Directive
- EN 1088
- EN 60204-1
- GS-ET-19

Certified Standards

Certification body	Standard	File No.
TÜV SÜD	EN 60947-5-1 (certified direct opening)	Consult your representative for details.
UL *1	UL 508, CSA C22.2 No.14	E76675
CQC (CCC)	GB14048.5	pending
KOSHA *2	EN60947-5-1	pending

*1. Certification has been obtained for UL CSA C22.2 No. 14.

Certified Standard Ratings

TÜV (EN 60947-5-1)

Utilization category	AC-15	DC-13
Rated operating current (Ie)	1.5 A *1 1 A *2	0.22 A
Rated operating voltage (Ue)	120 V	125 V

Note: Use a 4 A fuse that conforms to IEC 60127 as a short-circuit protection device. This fuse is not included with the switch.

*1. 11-42, 21-42, 21-22

*2. Other terminals

UL/CSA (UL 508, CSA C22.2 No. 14)
C150

Rated voltage	Carry current	Current (A)		Volt-amperes (VA)	
		Make	Break	Make	Break
120 VAC	2.5 A	15	1.5	1,800	180

R150

Rated voltage	Carry current	Current (A)		Volt-amperes (VA)	
		Make	Break	Make	Break
125 VDC	1.0 A	0.22	0.22	28	28

Solenoid Coil Characteristics

Item	24 VDC
Rated operating voltage (100% ED)	24 VDC $^{+10\%}_{-15\%}$
Current consumption*	Power ON: 6-contact type Approx. 6.4 W at 0.26 A 4-contact/5-contact type Approx. 4.8 W at 0.2 A Constant: Approx. 2.6 W (average) at 0.2 A (max.)
Insulation Class	Class E (120°C max.)

*A starting current is applied to the solenoid for for approx. 10 seconds. After this, the internal circuit switches to constant current.

Indicator

Item	LED Type
Rated voltage	24 VDC
Current consumption	Approx. 10 mA
Color (LED)	Orange

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G1

Specifications (continued)

Characteristics

Degree of protection *1		IP67 (EN60947-5-1)
Durability *2	Mechanical	1,000,000 operations min.
	Electrical	150,000 operations min. (1 A resistive load at 125 VAC) *3
Operating speed		0.05 to 1 m/s
Operating frequency		5 operations/minute max.
Direct opening force *4		60 N min. (EN60947-5-1)
Direct opening travel *4		15 mm min. (EN60947-5-1)
Holding force *5		1,300 N min.
Contact resistance		200 mΩ max.
Minimum applicable load *6		1 mA resistive load at 5 VDC (N-level reference value)
Rated insulation voltage (Ui)		150 V (EN60947-5-1)
Rated frequency		50/60 Hz
Protection against electric shock		Class II (double insulation)
Pollution degree (operating environment)		3 (EN60947-5-1)
Impulse withstand voltage (EN60947-5-1)	Between terminals of same polarity	1.5 kV
	Between terminals of different polarity	1.5 kV
	Between other terminals and non-current carrying metallic parts.	2.5 kV
Insulation resistance		100 MΩ min. (at 500 VDC)
Vibration resistance	Malfunction	10 to 55 Hz, 0.35 mm single amplitude
Shock resistance	Malfunction	80 m/s^2 min.
	Destruction	1,000 m/s^2 min.
Conditional short-circuit current		100 A (EN60947-5-1)
Conventional free air thermal current (Ith)		2.5 A (11-42, 21-52, 21-22) 1A (Others)
Ambient operating temperature		-10 to +55°C (with no icing)
Ambient operating humidity		95% max.
Weight		Head: Resin Approx. 290 g (Connector model) Approx. 330 g (Terminal block model) Head: Metal Approx. 370 g (Connector model) Approx. 410 g (Terminal block model)

Notes: 1. The above values are initial values.
2. The Switch contacts can be used with either standard loads or microloads. Once the contacts have been used to switch a load, however, they cannot be used to switch smaller loads.
The contact surfaces will become rough once they have been used and contact reliability for smaller loads may be reduced.

*1 The degree of protection is tested using the method specified by the standard (EN60947-5-1). Confirm that sealing properties are sufficient for the operating conditions and environment beforehand. Although the switch box is protected from dust, oil or water penetration, do not use the D4SL in places where cutting chips, oil, water or chemicals may enter through the key hole on the head, otherwise Switch damage or malfunctioning may occur.
*2 The durability is for an ambient temperature of 5 to 35°C and an ambient humidity of 40% to 70%. For more details, consult your OMRON representative.
*3 Do not pass the 1 A, 125 VAC load through more than 3 circuits.
*4 These figures are minimum requirements for safe operation.
*5 This figure is based on the GS-ET-19 evaluation method.
*6 This value will vary with the switching frequency, environment, and reliability level. Confirm that correct operation is possible with the actual load beforehand.
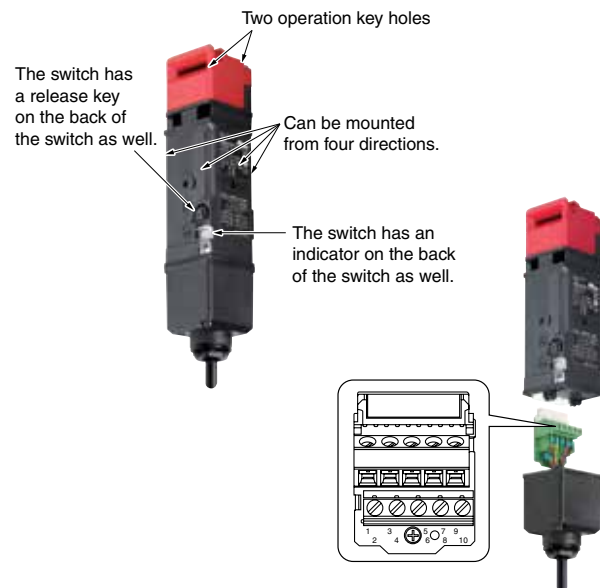
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Structure

Structure

D4SL-N□□□□D-□N Connector Type

Two operation key holes

The switch has a release key on the back of the switch as well.

Can be mounted from four directions.

The switch has an indicator on the back of the switch as well.

Notched side is No. 1
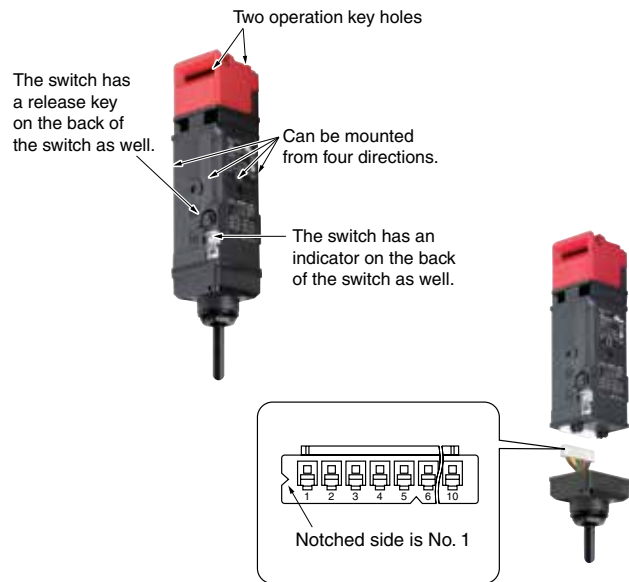
D4SL-N□□□□D-□ Terminal Block Type

Two operation key holes

The switch has a release key on the back of the switch as well.

Can be mounted from four directions.

The switch has an indicator on the back of the switch as well.

Terminal Arrangement

D4SL-N□N□□-D□
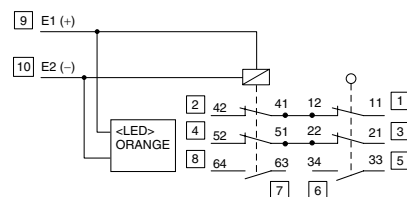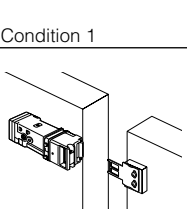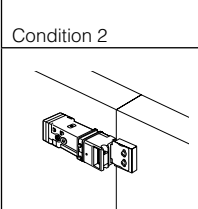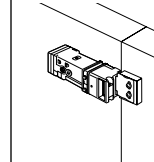
Note: Numbers inside the boxes are terminal numbers printed on the product.

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Structure (continued)

Operating Cycle Examples for Standard Models

D4SL-N□□□A-□ (Mechanical Lock Models)

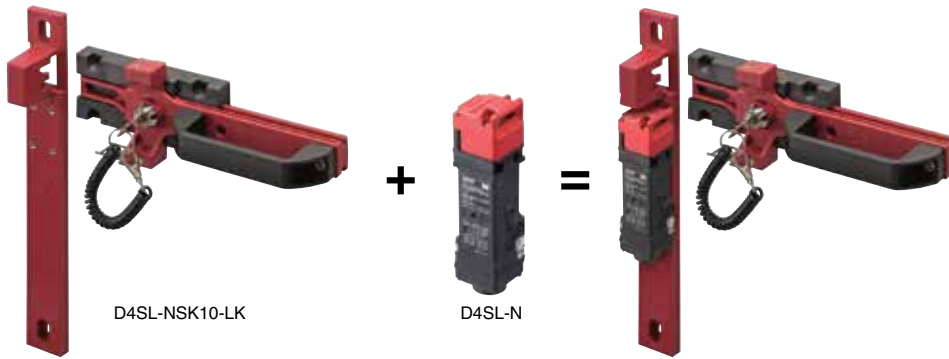| Terminal No. and Contact No.	Function	Condition 1 — Door open. The door will lock when the door closes.	Condition 2 — Door closed. The door is locked.	Condition 3 — Door closed. The door can be opened.	Turning the special release key — Door closed. No power is supplied to the solenoid. The door is unlocked manually.
[9]E1-[10]E2	Solenoid ON				
[2]42-[1]11 (NC) [4]52-[3]21 (NC)	Door open/closed detection and lock monitor contacts		shaded	shaded	
[3]21-[4]22 (NC) [5]31-[6]32 (NC)	Door open/closed detection contact		shaded	shaded	shaded
[5]33-[6]34 (NO)	Door open/closed detection contact	shaded			
[1]41-[2]42 (NC) [7]61-[8]62 (NC)	Lock monitor contact			shaded	
[7]63-[8]64 (NO)	Lock monitor contact	shaded			shaded

Return to condition 1

D4SL-N□□□G-□ (Solenoid Lock Models)

Terminal No. and Contact No.	Function	Even when the door is closed, it does not lock until power is supplied to the solenoid.	Door closed. The door is locked.	Door closed. The door can be opened.
[9]E1-[10]E2	Solenoid ON		shaded	
[2]42-[1]11 (NC) [4]52-[3]21 (NC)	Door open/closed detection and lock monitor contacts		shaded	shaded
[3]21-[4]22 (NC) [5]31-[6]32 (NC)	Door open/closed detection contact		shaded	shaded
[5]33-[6]34 (NO)	Door open/closed detection contact	shaded		
[1]41-[2]42 (NC) [7]61-[8]62 (NC)	Lock monitor contact		shaded	
[7]63-[8]64 (NO)	Lock monitor contact	shaded		shaded

The shaded areas indicate the contact is closed and power is supplied to the solenoid.

Door open/closed detection and lock monitor contacts:
Can be used in safety circuits because of the direct opening mechanisms.

Door open/closed detection contact:
Can be used to confirm whether the key is inserted and to monitor the open/closed status of a door.

Lock monitor contact:
Can be used to confirm whether power is supplied to the solenoid and to monitor whether or not a door can be opened or closed.

Notes: 1. The door open/closed detection and lock monitor contact configuration depends on the model.
2. If a current is detected in the solenoid lock model (built-in switches; N,P,Q,R), before the door is closed, the door will remain unlocked. Be sure to supply power to the solenoid after the door is closed.
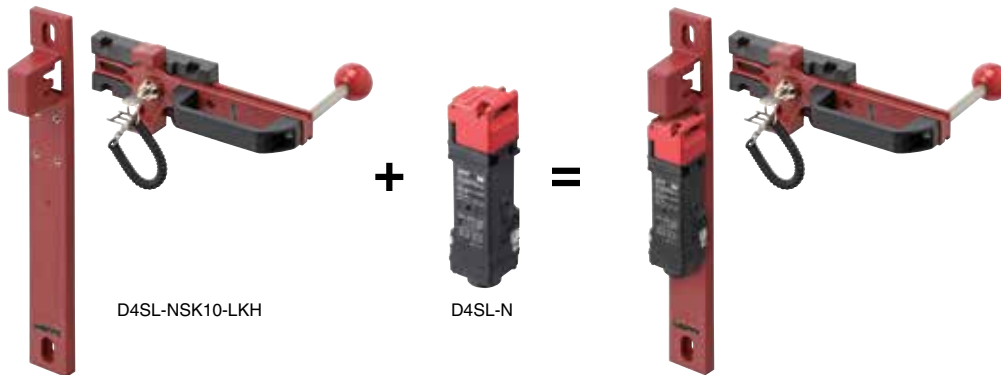
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Applicable Door Switches

D4SL-NSK10-LK

D4SL-NSK10-LK   D4SL-N

G

D4SL-NSK10-LKH

D4SL-NSK10-LKH   D4SL-N

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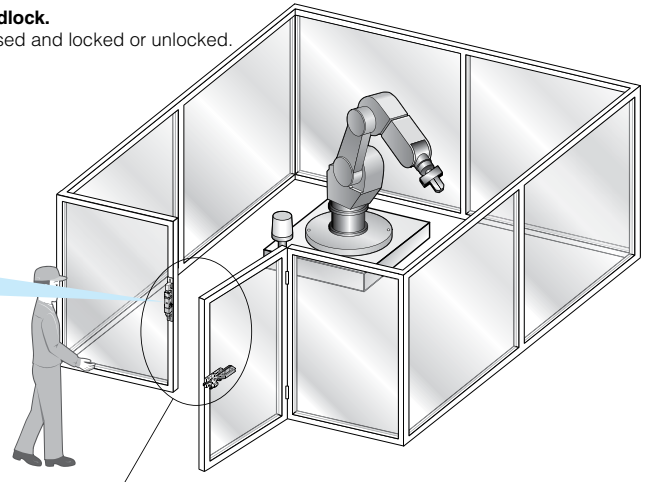**USA** Tel. 1/888/510-4357   **Canada** Tel. 1/866/986-6766   **www.sti.com**

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Door Switch Features

The lockout key prevents workers from becoming trapped without using a padlock.
Note: Using LEDs of D4SL-N enables confirming whether the door is open or closed and locked or unlocked.

Close door
Locked (power not supplied to solenoid) The slide handle is closed.

Close door
Unlocked (power supplied to solenoid) The slide handle is closed.
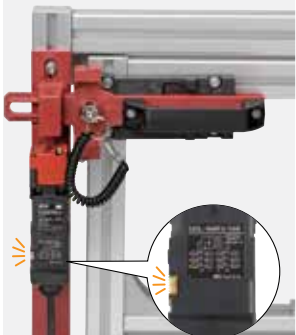
The slide handle can be pulled.

The handle-shaped fixture makes it easy to use the Door Switch.

Attach the supplied caution labels for display.

Lockout Key

Do not turn the key as in the figure above if the slide handle is closed.

Left door
Door Opening to the Left.

Open door
The slide handle is open.

When the slide handle is open, the lockout key can be pulled regardless of whether power is being supplied to the solenoid or not.

Open door
The slide handle is open.

The slide handle is secured at the position shown in the figure.
A worker holding the lockout key will not be trapped locked inside the hazardous area by another person.

Open door
The slide handle is open.

The slide handle does not move.

If the lockout key is not mounted, the slide handle will not move and the door will not close.
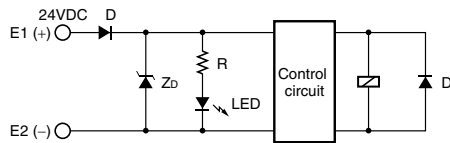
Connections

Internal Circuit Diagram

Without Indicator
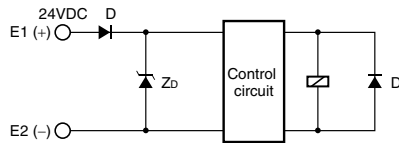
With Indicator

Circuit Connection Example

- Direct opening contacts used as safety-circuit input are indicated with the mark.
- Do not switch circuits for three or more standard loads at the same time. Doing so may adversely affect insulation performance.
- DC solenoids have polarity. (E1: Positive, E2: Negative) Confirm terminal polarity before wiring.
- If a lock is required for safety, design the system so that the closing of the NC contacts on both the door open/closed detection switch and the lock monitor switch is detected.
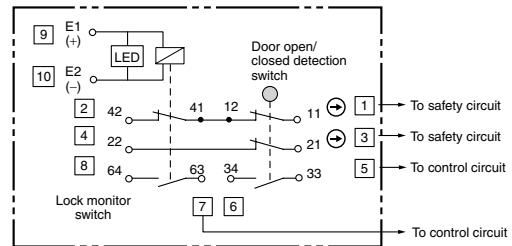
Connection Example for D4SL-N☐AF☐-☐
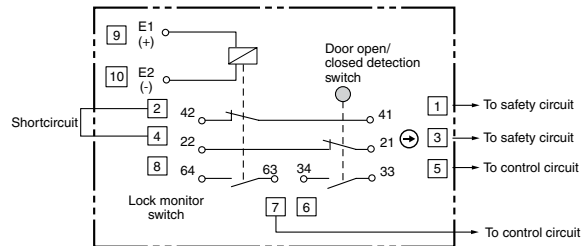Contacts 12 and 41 are internally connected.
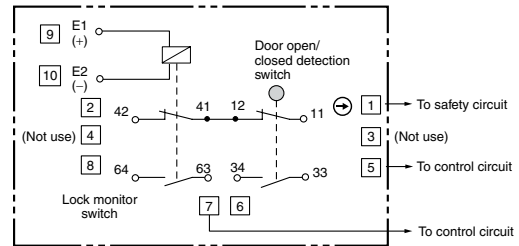
Connection Example for D4SL-N☐EF☐-D☐
Contacts 12 and 41 are internally connected.
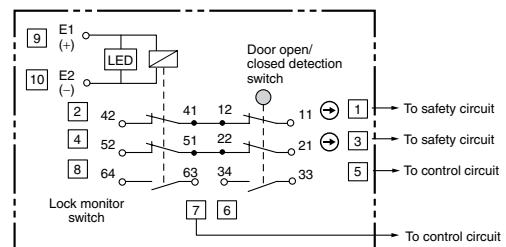

Connection Example for D4SL-N☐SF☐-☐
There is no internal connection, so connect contacts 22 and 42 externally.

Connection Example for D4SL-N☐NF☐-D☐
Contacts 12 and 41 and contacts 22 and 51 are internally connected.

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Connections (continued)

Contact Form

Indicates conditions where the Key is inserted and the lock is applied.

Model	Contact (door open/ closed detection and lock monitor)	Contact form		Operating pattern	Remarks
		Lock monitor	Door open/ closed detection		
D4SL-N□A□□-□	1NC/1NO+ 1NC/1NO			42-11, 34-33, 64-63	Only NC contact 11-12 has a certified direct opening mechanism. (→) The terminals 42-11, 34-33, and 64-63 can be used as unlike poles.
D4SL-N□B□□-□	1NC/1NO+2NC			42-11, 34-33, 62-61	Only NC contact 11-12 has a certified direct opening mechanism. (→) The terminals 42-11, 34-33, and 62-61 can be used as unlike poles.
D4SL-N□C□□-□	2NC+1NC/1NO			42-11, 32-31, 64-63	Only NC contact 11-12 and 31-32 have a certified direct opening mechanism. (→) The terminals 42-11, 32-31, and 64-63 can be used as unlike poles.
D4SL-N□D□□-□	2NC+2NC			42-11, 32-31, 62-61	Only NC contact 11-12 and 31-32 have a certified direct opening mechanism. (→) The terminals 42-11, 32-31, and 62-61 can be used as unlike poles.
D4SL-N□S□□-□	1NC/1NO+ 1NC/1NO			42-41, 22-21, 34-33, 64-63	Only NC contact 21-22 has a certified direct opening mechanism. (→) The terminals 42-41, 22-21, 34-33, and 64-63 can be used as unlike poles.
D4SL-N□T□□-□	1NC/1NO+2NC			42-41, 22-21, 34-33, 62-61	Only NC contact 21-22 has a certified direct opening mechanism. (→) The terminals 42-41, 22-21, 34-33, and 62-61 can be used as unlike poles.
D4SL-N□U□□-□	2NC+1NC/1NO			42-41, 22-21, 32-31, 64-63	Only NC contact 21-22, and 31-32 have a certified direct opening mechanism. (→) The terminals 42-41, 22-21, 32-31, and 64-63 can be used as unlike poles.
D4SL-N□V□□-□	2NC+2NC			42-41, 22-21, 32-31, 62-61	Only NC contact 21-22, and 31-32 have a certified direct opening mechanism. (→) The terminals 42-41, 22-21, 32-31, and 62-61 can be used as unlike poles.

G

Connections (continued)

Contact Form (continued)

Indicates conditions where the Key is inserted and the lock is applied.

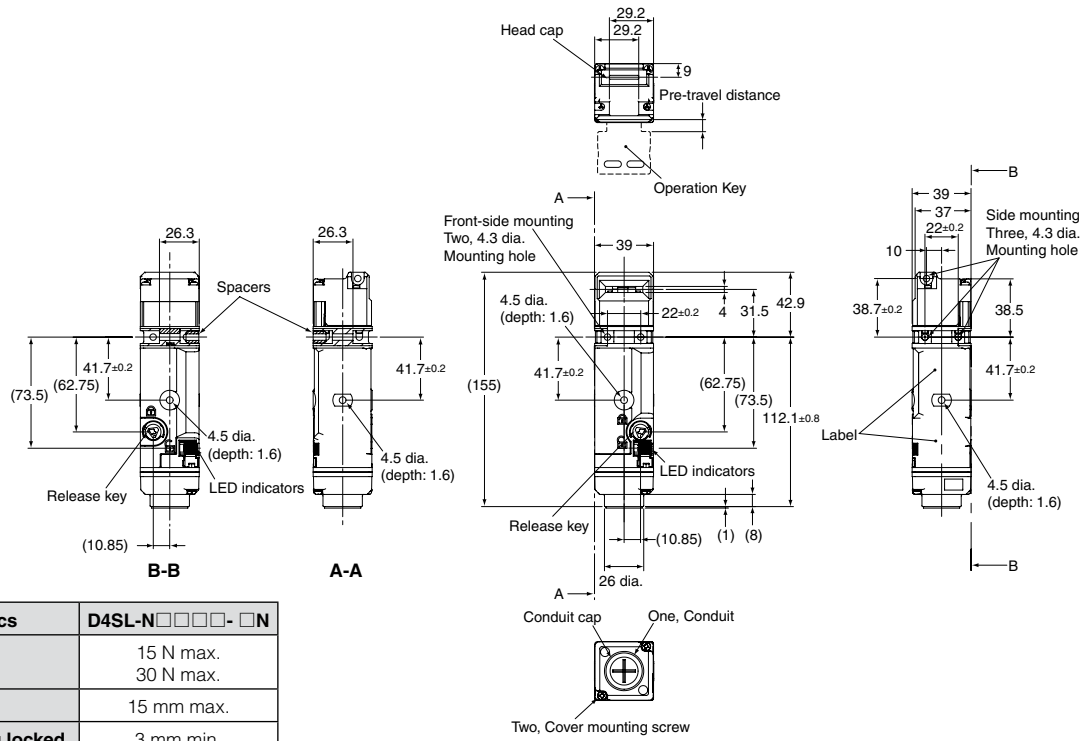| Model	Contact (door open/closed detection and lock monitor)	Contact form — Lock monitor	Door open/closed detection	Operating pattern	Remarks
D4SL-N□E□□-□	2NC/1NO+1NC/1NO			42-11, 22-21, 34-33, 64-63	Only NC contact 11-12 and 21-22 has a certified direct opening mechanism. The terminals 42-11, 22-21, 34-33, and 64-63 can be used as unlike poles.
D4SL-N□F□□-□	2NC/1NO+2NC			42-11, 22-21, 34-33, 62-61	Only NC contact 11-12 and 21-22 has a certified direct opening mechanism. The terminals 42-11, 22-21, 34-33, and 62-61 can be used as unlike poles.
D4SL-N□G□□-□	3NC+1NC/1NO			42-11, 22-21, 32-31, 64-63	Only NC contact 11-12, 21-22, and 31-32 has a certified direct opening mechanism. The terminals 42-11, 22-21, 32-31, and 64-63 can be used as unlike poles.
D4SL-N□H□□-□	3NC+2NC			42-11, 22-21, 32-31, 62-61	Only NC contact 11-12, 21-22, and 31-32 has a certified direct opening mechanism. The terminals 42-11, 22-21, 32-31, and 62-61 can be used as unlike poles.
D4SL-N□N□□-□	2NC/1NO+2NC/1NO			42-11, 52-21, 34-33, 64-63	Only NC contact 11-12 and 21-22 has a certified direct opening mechanism. The terminals 42-11, 52-21, 34-33, and 62-61 can be used as unlike poles.
D4SL-N□P□□-□	2NC/1NO+3NC			42-11, 52-21, 34-33, 62-61	Only NC contact 11-12 and 21-22 has a certified direct opening mechanism. The terminals 42-11, 52-21, 34-33, and 62-61 can be used as unlike poles.
D4SL-N□Q□□-□	3NC+2NC/1NO			42-11, 52-21, 32-31, 64-63	Only NC contact 11-21, 21-22, and 31-32 have a certified direct opening mechanism. The terminals 42-11, 52-21, 32-31, and 64-63 can be used as unlike poles.
D4SL-N□R□□-□	3NC+3NC			42-11, 52-21, 32-31, 62-61	Only NC contact 11-12, 21-22, and 31-32 have a certified direct opening mechanism. The terminals 42-11, 52-21, 32-31, and 62-61 can be used as unlike poles.

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Dimensions and Operating Characteristics

(mm)

Switches

D4SL-N□□□□-□N (Connector Type)

Head cap

29.2
29.2
9
Pre-travel distance

Operation Key

Spacers

26.3

26.3

41.7±0.2
(62.75)

41.7±0.2

(73.5)

4.5 dia.
(depth: 1.6)

4.5 dia.
(depth: 1.6)

Release key

LED indicators

(10.85)

B-B

A-A

Front-side mounting
Two, 4.3 dia.
Mounting hole

A

39

4.5 dia.
(depth: 1.6)

41.7±0.2

(155)

22±0.2 4 31.5 42.9

(62.75)
(73.5)
112.1±0.8

Release key

LED indicators

(10.85) (1) (8)

26 dia.

A

Conduit cap   One, Conduit

Two, Cover mounting screw

B

39
37
22±0.2

10

38.7±0.2

Side mounting
Three, 4.3 dia.
Mounting hole

38.5

41.7±0.2

Label

4.5 dia.
(depth: 1.6)

B

Operating characteristics	D4SL-N□□□□- □N
Key insertion force **Key extraction force**	15 N max. 30 N max.
Pre-travel distance	15 mm max.
Movement before being locked	3 mm min.

D4SL-N□□□□-□ (Terminal Block Type)
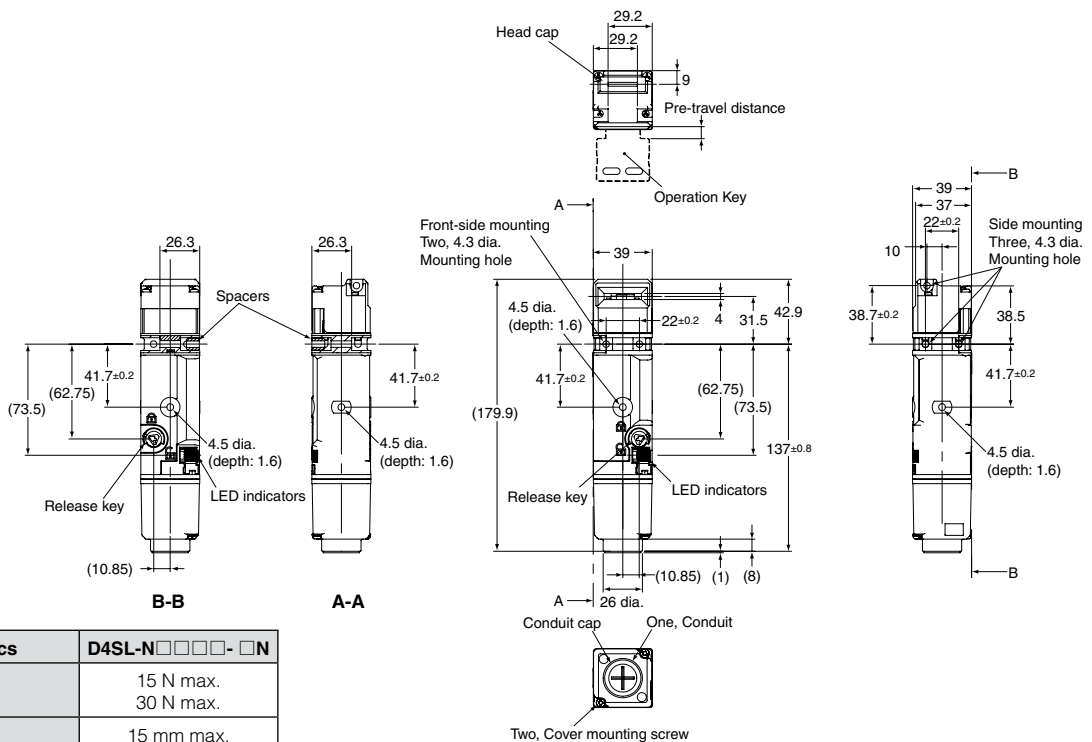
Head cap

29.2
29.2
9
Pre-travel distance

Operation Key

Spacers

26.3

26.3

41.7±0.2
(62.75)

41.7±0.2

(73.5)

4.5 dia.
(depth: 1.6)

4.5 dia.
(depth: 1.6)

Release key

LED indicators

(10.85)

B-B

A-A

Front-side mounting
Two, 4.3 dia.
Mounting hole

A

39

4.5 dia.
(depth: 1.6)

41.7±0.2

(179.9)

22±0.2 4 31.5 42.9

(62.75)
(73.5)
137±0.8

Release key

LED indicators

(10.85) (1) (8)

26 dia.

A

Conduit cap   One, Conduit

Two, Cover mounting screw

B

39
37
22±0.2

10

38.7±0.2

Side mounting
Three, 4.3 dia.
Mounting hole

38.5

41.7±0.2

4.5 dia.
(depth: 1.6)

B

Operating characteristics	D4SL-N□□□□- □N
Key insertion force **Key extraction force**	15 N max. 30 N max.
Pre-travel distance	15 mm max.
Movement before being locked	3 mm min.

Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

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Dimensions and Operating Characteristics (continued) (mm)
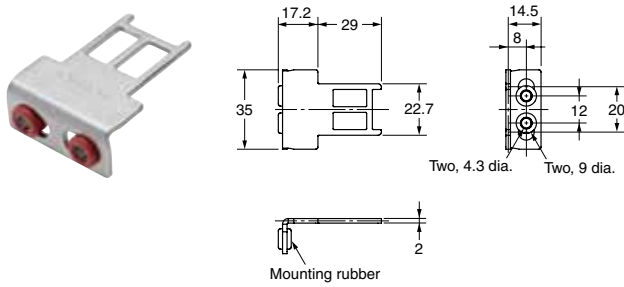
Operation Keys

D4SL-NK1
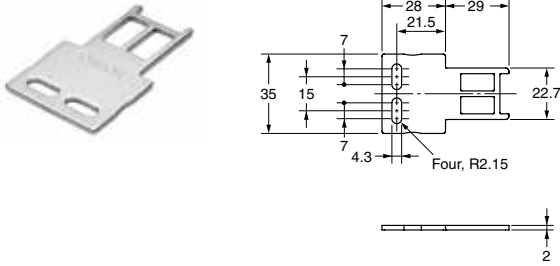
D4SL-NK1S
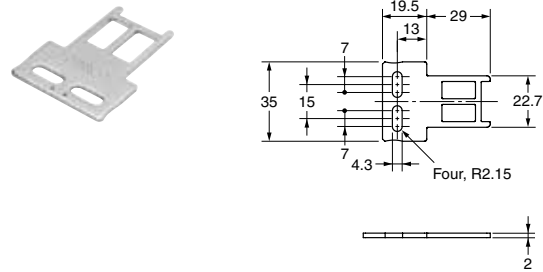
D4SL-NK1G
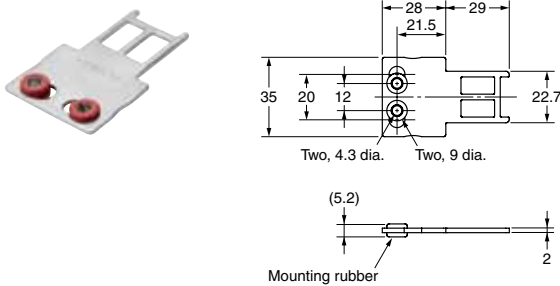
D4SL-NK2
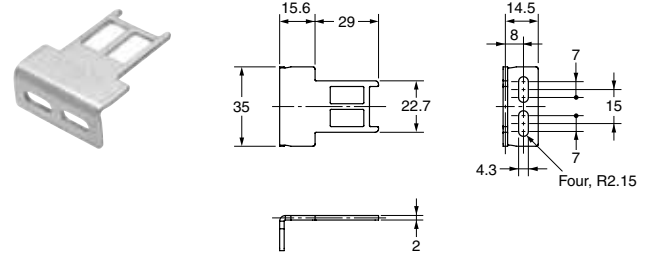
D4SL-NK2G

D4SL-NK3
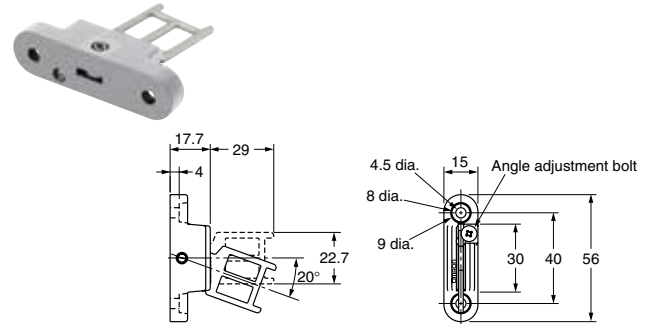
Connector Cable

D4SL-CN□

Connector pin No.   Connector

Cable
AWG22, 10 conductors

* All 10 lead wires laid bare.
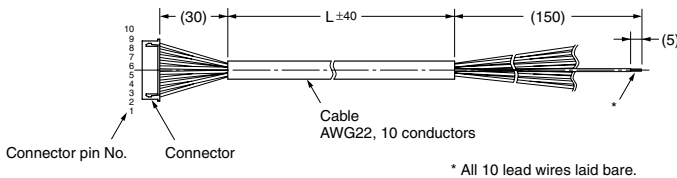
Model	L size
D4SL-CN1	1 m
D4SL-CN3	3 m
D4SL-CN5	5 m

Connector No.	Lead wire color
1	Black
2	Black/White
3	Red
4	Red/White
6	Green

Connector No.	Lead wire color
6	Green/White
7	Yellow
8	Yellow/White
9	Brown
10	Brown White

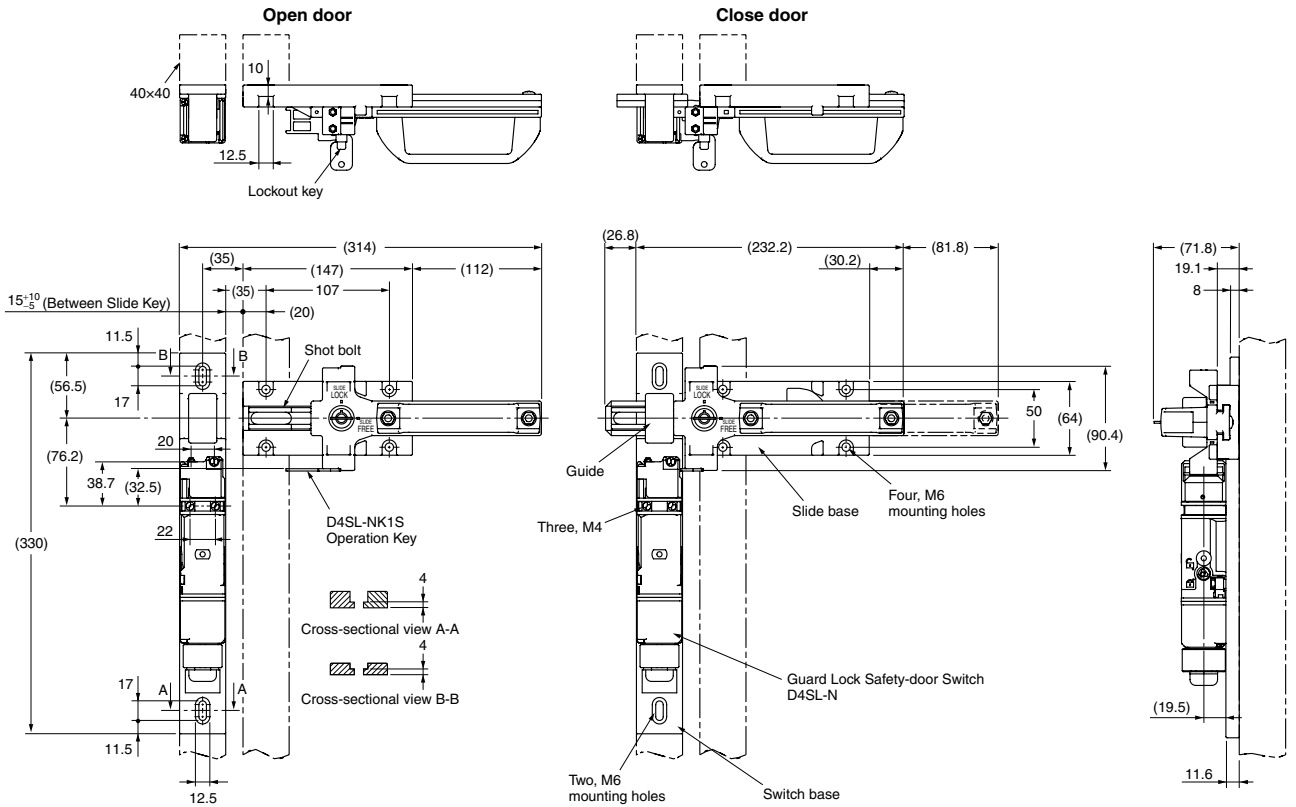Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

M20-NPT Adapter

0.52 in.
[13.3mm]

1.04 in.
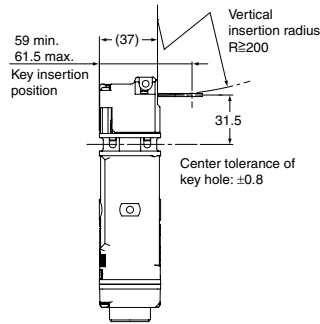[26.4mm]

0.82 in.
[20.9mm]

0.92 in.
[23.5mm]

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Dimensions and Operating Characteristics

Slide Key

D4SL-NSK10-LK

Open door

40×40
10
12.5
Lockout key

Close door

(314)
(35)
(147)
(112)
(35)
107
(20)
15 +10/-5 (Between Slide Key)
11.5
B B Shot bolt
(56.5)
17
20
(76.2)
38.7 (32.5)
22
(330)
17 A A
11.5
12.5

D4SL-NK1S Operation Key

4
Cross-sectional view A-A
4
Cross-sectional view B-B

(26.8)
(232.2)
(30.2)
(81.8)
Guide
Three, M4
Slide base
Four, M6 mounting holes
50 (64)
(90.4)
Guard Lock Safety-door Switch D4SL-N
Two, M6 mounting holes
Switch base

(71.8)
19.1
8
(19.5)
11.6

D4SL-NSK10-LKH

Open door

Aluminum frame 40×40
10
12.5
Lockout key

Close door

(323)
(35)
(147)
(121)
(35)
107
(20)
15 +10/-5 (Between Slide Key)
11.5
40
B B Shot bolt
(56.5)
17
20
(76.2)
38.7 (32.5)
22
330
50 (64)
90.4
17 A A
11.5
12.5

D4SL-NK1S Operation Key

4
Cross-sectional view B-B
4
Cross-sectional view A-A

Guard Lock Safety-door Switch D4SL-N□□□□-□□

Guard Lock Safety-door Switch D4SL-N□□□□-□□N

(26.8)
(241.2)
(81.8)
(39.2)
Guide
Three, M4
Slide base
Four, M6 mounting holes
Two, M6 mounting holes
Switch base

(71.8)
19.1
8
(115)
(78)
12 dia.
40 dia.
Inner Lever
(19.5)
11.6

G

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G11

Dimensions and Operating Characteristics (continued)

(mm)

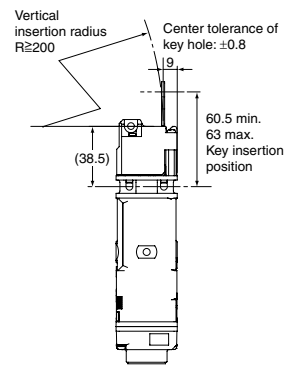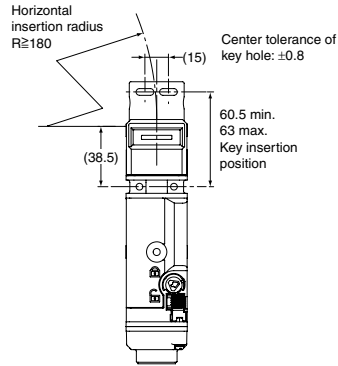## Operating Key Mounting
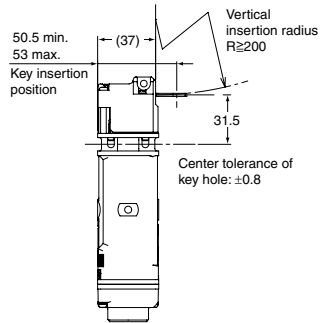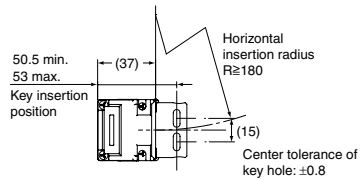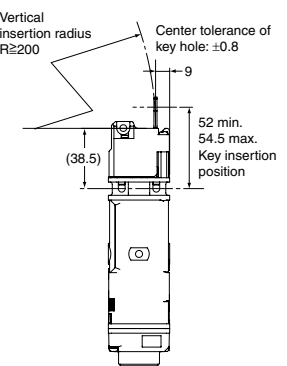
D4SL-N+D4SL-NK1

With Front-inserted Operation Key

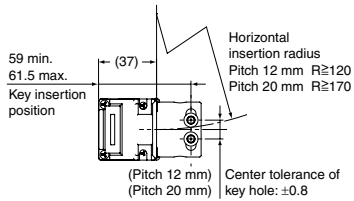

59 min.
61.5 max.
Key insertion position
(37)
Horizontal insertion radius R≧180
(15)
Center tolerance of key hole: ±0.8

59 min.
61.5 max.
Key insertion position
(37)
Vertical insertion radius R≧200
31.5
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius R≧180
(15)
Center tolerance of key hole: ±0.8
60.5 min.
63 max.
Key insertion position
(38.5)

Vertical insertion radius R≧200
Center tolerance of key hole: ±0.8
9
60.5 min.
63 max.
Key insertion position
(38.5)

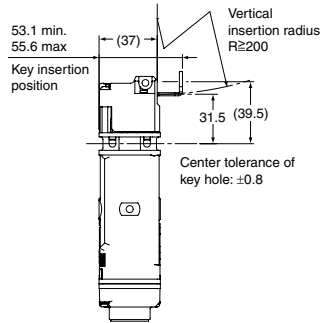### D4SL-N+D4SL-NK1S

With Front-inserted Operation Key

50.5 min.
53 max.
Key insertion position
(37)
Horizontal insertion radius R≧180
(15)
Center tolerance of key hole: ±0.8

50.5 min.
53 max.
Key insertion position
(37)
Vertical insertion radius R≧200
31.5
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius R≧180
(15)
Center tolerance of key hole: ±0.8
52 min.
54.5 max.
Key insertion position
(38.5)

Vertical insertion radius R≧200
Center tolerance of key hole: ±0.8
9
52 min.
54.5 max.
Key insertion position
(38.5)

D4SL-N+D4SL-NK1G

With Front-inserted Operation Key

59 min.
61.5 max.
Key insertion position
(37)
Horizontal insertion radius
Pitch 12 mm R≧120
Pitch 20 mm R≧170
(Pitch 12 mm)
(Pitch 20 mm)
Center tolerance of key hole: ±0.8

59 min.
61.5 max.
Key insertion position
(37)
Vertical insertion radius R≧140
(28.9) 31.5
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius
Pitch 12 mm R≧120
Pitch 20 mm R≧170
Center tolerance of key hole: ±0.8
(Pitch 12 mm)
(Pitch 20 mm)
60.5 min.
63 max.
Key insertion position
(38.5)

Vertical insertion radius R≧140
Center tolerance of key hole: ±0.8
9
(6.4)
60.5 min.
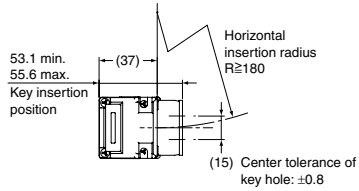63 max.
Key insertion position
(38.5)

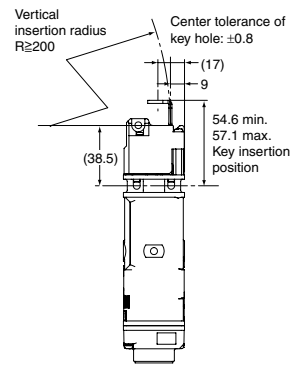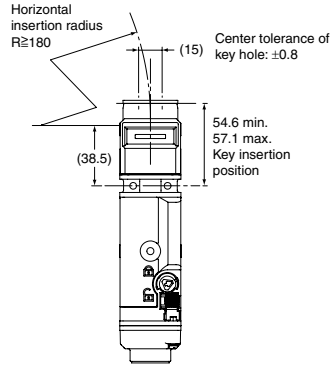# Dimensions and Operating Characteristics (continued)

(mm)

Operating Key Mounting (continued)

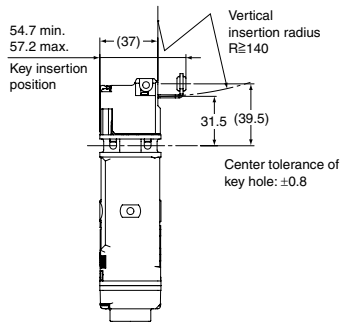### D4SL-N+D4SL-NK2

With Front-inserted Operation Key

53.1 min.
55.6 max.
Key insertion position
(37)
Horizontal insertion radius R≧180
(15) Center tolerance of key hole: ±0.8

53.1 min.
55.6 max
Key insertion position
(37)
Vertical insertion radius R≧200
31.5 (39.5)
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius R≧180
(15)
Center tolerance of key hole: ±0.8
54.6 min.
57.1 max.
Key insertion position
(38.5)

Vertical insertion radius R≧200
Center tolerance of key hole: ±0.8
(17)
9
54.6 min.
57.1 max.
Key insertion position
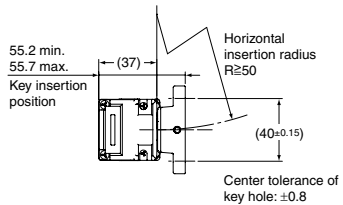(38.5)

D4SL-N+D4SL-NK2G

With Front-inserted Operation Key

54.7 min.
57.2 max.
Key insertion position
(37)
Horizontal insertion radius
Pitch 12 mm R≧120
Pitch 20 mm R≧170
(Pitch 12 mm) Center tolerance of
(Pitch 20 mm) key hole: ±0.8

54.7 min.
57.2 max.
Key insertion position
(37)
Vertical insertion radius R≧140
31.5 (39.5)
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius
Pitch 12 mm R≧120
Pitch 20 mm R≧170
Center tolerance of key hole: ±0.8
(Pitch 12 mm)
(Pitch 20 mm)
56.2 min.
58.7 max.
Key insertion position
(38.5)

Vertical insertion radius R≧140
Center tolerance of key hole: ±0.8
(21.5)
9
56.2 min.
58.7 max.
Key insertion position
(38.5)

D4SL-N+D4SL-NK3

With Front-inserted Operation Key

55.2 min.
55.7 max.
Key insertion position
(37)
Horizontal insertion radius R≧50
(40±0.15)
Center tolerance of key hole: ±0.8

55.2 min.
55.7 max.
Key insertion position
(37)
Vertical insertion radius R≧200
31.5
Center tolerance of key hole: ±0.8

With Top-Inserted Operation Key

Horizontal insertion radius R≧50
(40±0.15)
Center tolerance of key hole: ±0.8
56.7 min.
59.2 max.
Key insertion position
(38.5)

Vertical insertion radius R≧200
Center tolerance of key hole: ±0.8
(9)
56.7 min.
59.2 max.
Key insertion position
(38.5)

G

Application Examples

D4SL-N Application Example

| PL/Safety Category	Applied models	Stop category	Reset method
Equivalent to PLe/4	D4SL-N□R□A-□ Compact Safety Door Switch with Magnetic Lock (mechanical lock) G9SA-301 (24 VAC/DC) Safety Relay Unit	0	Manual

Application Overview

• If the guard is opened, it is detected with S2 and the power supply to the motor (M) is shut OFF.
• When the guard is closed, the lock status can be detected and the power supply to the motor (M) remains shut OFF until limit switch S3 is pressed.
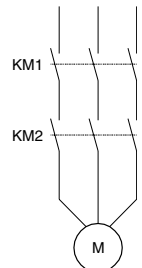
S1: Safety Limit Switch with direct opening mechanism
   (D4B-N, D4N, D4F) ⊖
S2: D4SL-N
S3: Reset switch
S4: Lock release switch
KM1 and KM2: Magnetic Contactor
M: 3-phase motor
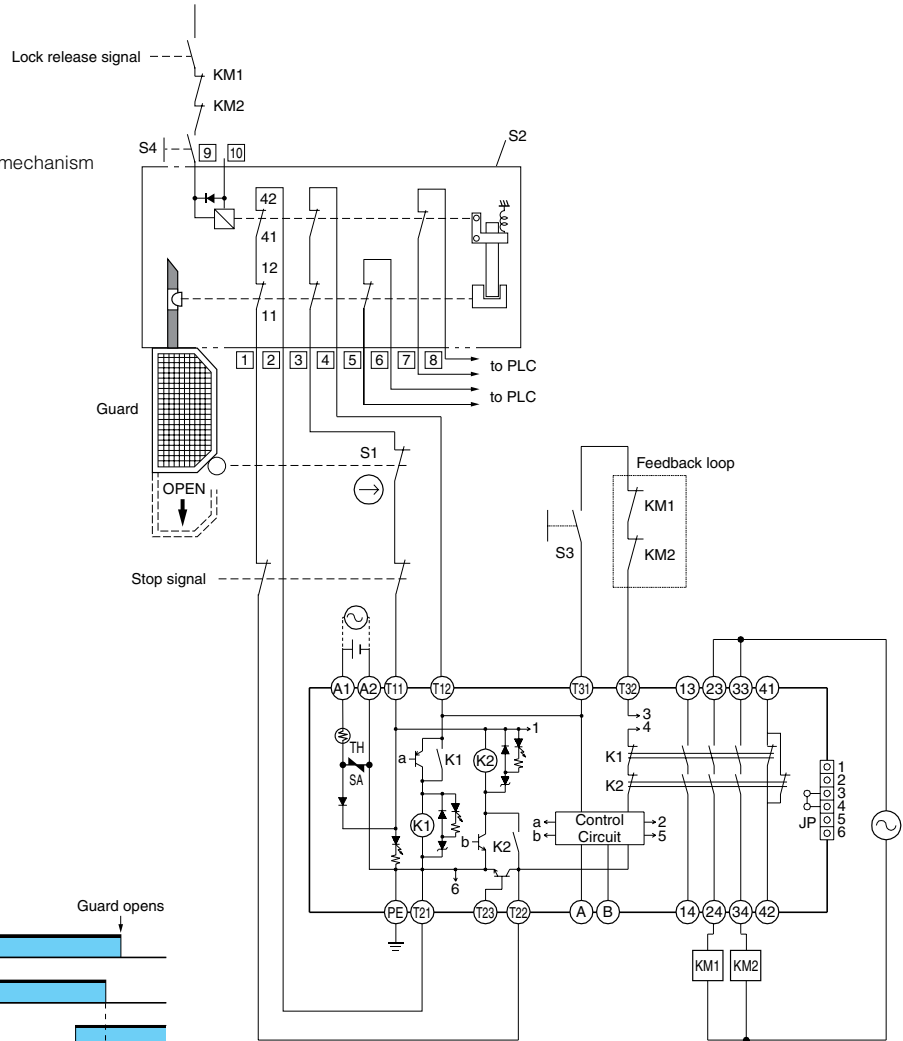
Timing Chart
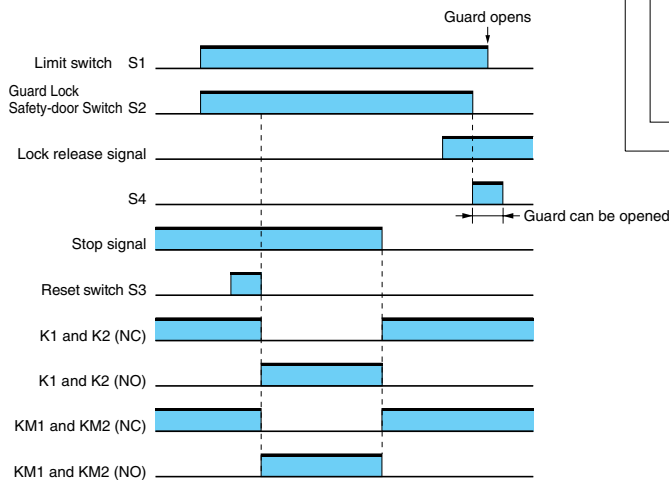
Notes: 1. The above circuit diagram is for Category 3.
2. Numbers inside the boxes are terminal numbers printed on the product.

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Ordering

Model Number Structure

Switch

D4SL – N ☐ ☐ ☐ ☐ – ☐ ☐ ☐
　　　　❶ ❷ ❸ ❹　❺ ❻ ❼

❶ Conduit Size
2: G1/2 (conduit)
3: 1/2-14 NPT (M20, includes M20-to-1/2-14NPT conversion adapter)
4: M20

❷ Built-in Switch
4-contact Model: Door monitor and lock monitors are connected in series internally
A: 1NC/1NO + 1NC/1NO
B: 1NC/1NO + 2NC
C: 2NC + 1NC/1NO
D: 2NC + 2NC

4-contact Model: Door monitor and lock monitors are NOT connected in series internally
S: 1NC/1NO + 1NC/1NO
T: 1NC/1NO + 2NC
U: 2NC + 1NC/1NO
V: 2NC + 2NC

5-contact Model
E: 2NC/1NO + 1NC/1NO
F: 2NC/1NO + 2NC
G: 3NC + 1NC/1NO
H: 3NC + 2NC

6-contact Model
N: 2NC/1NO + 2NC/1NO
P: 2NC/1NO + 3NC
Q: 3NC + 2NC/1NO
R: 3NC + 3NC

❸ Head Material
4-contact Model
F: Resin

5- or 6-contact Model (common)
F: Resin
D: Metal

❹ Door Lock and Release
A: Mechanical lock/24 VDC solenoid release
G: 24 VDC solenoid lock/mechanical release

❺ Indicator
4-contact Model
Blank: None

5- or 6-contact Model (common)
D: 24 VDC (orange LED indicator)

❻ Release Key Type
4-contact Model
Blank: Standard release key (metal)

5- or 6-contact Model (common)
Blank: Special release key (metal)
4: Special release key (resin) (Note: Release keys are provided)

❼ Connection Method
Blank: Terminal block
N: Connector *1

*1. Connector cables are not included with the connector type and are to be purchased separately.

Operation Key

D4SL-NK ☐ ☐
　　　　　❶ ❷

❶ Operation Key Type
1: Horizontal mounting
2: Vertical mounting
3: Adjustable mounting (horizontal)

❶ Key Type
Blank: No cushion rubber
G: Cushion rubber
S: No cushion rubber, short type

G

Ordering (continued)

List of Models

Release Key Type	Wiring method	Solenoid voltage/ Indicator	Lock and release type	Contact configuration (door open/closed detection switch and lock monitor switch contacts)	Conduit size (See Note.)	Model
Standard (metal)	Connector	24VDC (Orange)	Mechanical lock Solenoid release	6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.	G1/2	D4SL-N2□FA-DN
					1/2-14NPT	D4SL-N3□FA-DN
					1/2-14NPT	D4SL-N3NFA-DN
					M20	D4SL-N4□FA-DN
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.	G1/2	D4SL-N2□FA-DN
					1/2-14NPT	D4SL-N3□FA-DN
					M20	D4SL-N4□FA-DN
		24VDC (without indicator)		4-contact Model Insert the built-in switch (A, B, C, D, S, T, U or V) into the blank □.	G1/2	D4SL-N2□FA-N
					1/2-14NPT	D4SL-N3□FA-N
					M20	D4SL-N4□FA-N
	Terminal block	24VDC (Orange)		6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.	G1/2	D4SL-N2□FA-D
					1/2-14NPT	D4SL-N3□FA-D
					1/2-14NPT	D4SL-N3NFA-D
					1/2-14NPT	D4SL-N3QFA-D
					M20	D4SL-N4□FA-D
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.	G1/2	D4SL-N2□FA-D
					1/2-14NPT	D4SL-N3□FA-D
					M20	D4SL-N4□FA-D
		24VDC (without indicator)		4-contact Model Insert the built-in switch (A, B, C, D, S, T, U or V) into the blank □.	G1/2	D4SL-N2□FA
					1/2-14NPT	D4SL-N3□FA
					M20	D4SL-N4□FA
	Connector	24VDC (Orange)	Solenoid lock Mechanical release	6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.	G1/2	D4SL-N2□FG-DN
					1/2-14NPT	D4SL-N3□FG-DN
					1/2-14NPT	D4SL-N3NFG-DN
					M20	D4SL-N4□FG-DN
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.	G1/2	D4SL-N2□FG-DN
					1/2-14NPT	D4SL-N3□FG-DN
					1/2-14NPT	D4SL-N3HFG-DN
					M20	D4SL-N4□FG-DN
		24VDC (without indicator)		4-contact Model Insert the built-in switch (A, B, C, D, S, T, U or V) into the blank □.	G1/2	D4SL-N2□FG-N
					1/2-14NPT	D4SL-N3□FG-N
					M20	D4SL-N4□FG-N
	Terminal block	24VDC (Orange)		6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.	G1/2	D4SL-N2□FG-D
					1/2-14NPT	D4SL-N3□FG-D
					1/2-14NPT	D4SL-N3NFG-D
					M20	D4SL-N4□FG-D
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.	G1/2	D4SL-N2□FG-D
					1/2-14NPT	D4SL-N3□FG-D
					M20	D4SL-N4□FG-D
		24VDC (without indicator)		4-contact Model Insert the built-in switch (A, B, C, D, S, T, U or V) into the blank □.	G1/2	D4SL-N2□FG
					1/2-14NPT	D4SL-N3□FG
					M20	D4SL-N4□FG

Note: The recommended models for equipment and machinery being exported to Europe are those with an M20 conduit sizes, and for North America, the recommended models are those with a 1/2-14NPT conduit sizes.

[highlighted box] = Highlighted **Rapid Delivery** products are available for shipment today or within **FIVE** days.

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Ordering (continued)

List of Models (continued)

Release Key Type	Wiring method	Solenoid voltage/ Indicator	Lock and release type	Contact configuration (door open/closed detection switch and lock monitor switch contacts)		Conduit size (See Note.)	Model
Special (resin)	Connector	24VDC (Orange)	Mechanical lock Solenoid release	6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.		G1/2	D4SL-N2□FA-D4N
						1/2-14NPT	D4SL-N3□FA-D4N
						M20	D4SL-N4□FA-D4N
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.		G1/2	D4SL-N2□FA-D4N
						1/2-14NPT	D4SL-N3□FA-D4N
						M20	D4SL-N4□FA-D4N
	Terminal block			6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.		G1/2	D4SL-N2□FA-D4
						1/2-14NPT	D4SL-N3□FA-D4
						1/2-14NPT	D4SL-N3NFA-D4
						M20	D4SL-N4□FA-D4
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.		G1/2	D4SL-N2□FA-D4
						1/2-14NPT	D4SL-N3□FA-D4
						M20	D4SL-N4□FA-D4
	Connector		Solenoid lock Mechanical release	6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.		G1/2	D4SL-N2□FG-D4N
						G1/2	D4SL-N2NFG-D4N
						1/2-14NPT	D4SL-N3□FG-D4N
						M20	D4SL-N4□FG-D4N
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.		G1/2	D4SL-N2□FG-D4N
						1/2-14NPT	D4SL-N3□FG-D4N
						M20	D4SL-N4□FG-D4N
	Terminal block			6-contact Model Insert the built-in switch (N, P, Q or R) into the blank □.		G1/2	D4SL-N2□FG-D4
						1/2-14NPT	D4SL-N3□FG-D4
						1/2-14NPT	D4SL-N3NFG-D4
						M20	D4SL-N4□FG-D4
				5-contact Model Insert the built-in switch (E, F, G or H) into the blank □.		G1/2	D4SL-N2□FG-D4
						1/2-14NPT	D4SL-N3□FG-D4
						M20	D4SL-N4□FG-D4

Note: The recommended models for equipment and machinery being exported to Europe are those with an M20 conduit sizes, and for North America, the recommended models are those with a 1/2-14NPT conduit sizes.

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Ordering (continued)

Operation Keys

Type	Model
Horizontal mounting	D4SL-NK1
Horizontal mounting (Short)	D4SL-NK1S
Horizontal mounting (Cushion rubber)	D4SL-NK1G
Vertical mounting	D4SL-NK2

Vertical mounting (Cushion rubber)	D4SL-NK2G
Adjustable (Horizontal)	D4SL-NK3

Notes:
D4SL-NK☐☐ actuators are compatible with both D4SL & D4SL-N switches
D4SL-K☐☐ actuators are also compatible with both D4SL & D4SL-N switches

Connector Cables

Type	Model
1 m	D4SL-CN1
3 m	D4SL-CN3
5 m	D4SL-CN5

Slide Key

Type	Specifications	Contents	Model	Applicable Door Switch
	Weight: Approx. 0.6 kg Mechanical durability: 20,000 operations min.	Slide Key: 1 (not yet mounted) D4SL-N mounting plate: 1 Door Switch special mounting screws: 3 D4SL-NK1 (operation key): 1 D4SL-NK1 special mounting screws: 2 Lockout keys: 2 Lockout key strap: 1 Caution labels (stickers): 2 sheets (English and Japanese)	D4SL-NSK10-LK	D4SL-N
	Weight: Approx. 0.1 kg	Inner Lever: 1	D4SL-SK10H *	---
	Weight: Approx. 0.7 kg Mechanical durability: 20,000 operations min.	Slide Key: 1 (not yet mounted) Inner Lever: 1 D4SL-N mounting plate: 1 Door Switch special mounting screws: 3 D4SL-NK1 (operation key): 1 D4SL-NK1 special mounting screws: 2 Lockout keys: 2 Lockout key strap: 1 Caution labels (stickers): 2 sheets (English and Japanese)	D4SL-NSK10-LKH	D4SL-N

☐ = Highlighted **Rapid Delivery** products are available for shipment today or within **FIVE** days.

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